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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,316	10/15/2001	Ki-deok Bae	Q66357	1888

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EXAMINER

VINH, LAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,316

Applicant(s)

BAE ET AL.

Examiner

Lan Vinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-12 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-12 and 15 is/are allowed.
- 6) ☒ Claim(s) 5-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/976316.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 5, 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Hetrick et al (US 6,404,028)

Hetrick discloses a method for fabricating an adhesion-resistant microelectro-mechanical device. This method comprises the steps of:

forming a substrate 26 (col 5, lines 48-49), forming an AHC layer to reduce sticking/stiction on the substrate, the AHC layer can be removed by plasma etch/dry etch (col 7, lines 41-44; col 8, lines 23-25), forming a sacrificial layer 36 (PSG) on the substrate, the layer 36 is removed by HF acid solution/ wet etching (col 7, lines 25-27), removing parts of AHC layer 42 and layer 36 to expose part of the substrate and forming a structure including a post as seen in fig. 8, forming a structural layer 42 over the structure (col 8, lines 1-3; fig. 10)

The limitation of claim 8 has been discussed above.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hetrick et al (US 6,404,028) in view of Offenberg (US 5,683,591).

Hetrick's method has been described above. Unlike the instant claimed inventions as per claims 6-7, Hetrick does not specifically disclose forming the anti-stiction layer of polysilicon/photoresist.

However, Offenberg discloses a process for producing surface micromechanical structure comprises the steps of: forming a layer 11/anti-stiction layer of polysilicon/photoresist after forming a sacrificial layer to prevent adhesion (col 3, lines 49-60, col 4, lines 50-61), the layer 11 is removed by dry vapor-phase etching (col 4, lines 36-37).

Hence, one skilled in the art would have found it obvious to modify Hetrick's method by forming a anti-stiction layer of polysilicon/photoresist as per Offenberg because according to Offenberg the stiffener layer 11 made of photoresist etching more slowly which prevent the structure from being deflected and adhering and instead of photoresist, polysilicon is employed which etches slowly and without leaving residues in vapor-etching (col 4, lines 25-55)

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Allowable Subject Matter

5. Claims 9-12, 15 allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claims 9, 15, the applicants have presented a persuasive argument, see the last paragraph on page 6 of the response filed on 3/1/2004 that the cited prior art of record fails to disclose or suggest a method for fabricating microstructure comprises the step of removing the sacrificial layer by wet etching and removing the anti-stiction layer by dry etching in order to release the at least one microstructure while preventing stiction/forming at least one structure layer for forming at least one microstructure on the anti-stiction layer and removing the sacrificial layer by wet etching while removing the anti-stiction layer by dry etching in order to release the at least one microstructure while preventing stiction. The closest cited prior art of Hetrick et al (US 6,404,028) discloses a method for fabricating microstructure comprises the step of removing the sacrificial layer 36 to release the microstructure by wet etching while removing the AHC layer 42/release layer 44/anti-stiction layer by dry etching to pattern the AHC/anti-stiction layer based on the desired microstructure (col 8, lines 8-11)

Response to Arguments

6. Applicant's arguments filed 3/1/2004 with respect to the rejection of claim 5-8 have been fully considered but they are not persuasive.

The applicants argue that Hetrick 's AHC coating is not removed by any process and thus can not correspond to the recited anti-stiction layer because Hetrick discloses

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a micromechanical device that is coated with AHC coating after fabrication of the device in one embodiment and removing the AHC deposited on top of the release layer 44, while leaving the AHC deposited underlying material to form patterned structure in another embodiment. This argument is unpersuasive because while it is true that Hetrick discloses coating a micromechanical device with AHC after fabrication of the device and removing the AHC deposited on top of the release layer 44, while leaving the AHC deposited underlying material to form patterned structure, it is also true that Hetrick discloses forming a AHC layer, the AHC layer prevents sticking (col 7, lines 41-43) and removing the AHC layer by a lift off process and the AHC is patterned by a lift off process using plasma etch in chlorine or fluorine based chemistry (col 8, lines 8-25), which reads on forming an anti-stiction layer that is removed by dry etching. Thus, the examiner asserts that Hetrick 's AHC coating is removed by a plasma/ dry etching process and thus can correspond to the recited anti-stiction layer as required by claim 5.

Applicant's arguments filed 3/1/2004, with respect to the rejections of claims 9-12, 15 have been fully considered and are persuasive. The rejections of claims 9-12, 15 have been withdrawn.

7. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.



LV
April 1, 2004